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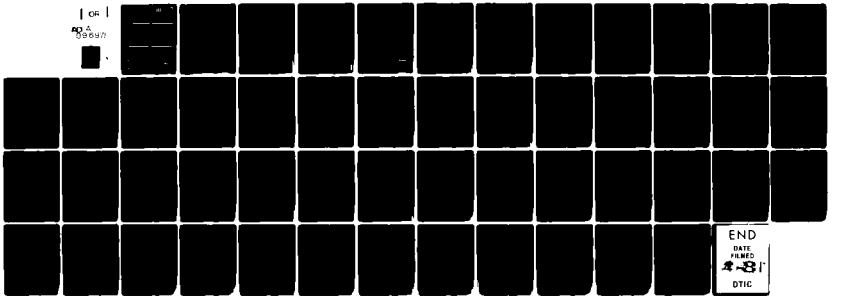

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Civilian Earnings of Military Retirees

Patricia Munch Danzon

A Report prepared for

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE/
MANPOWER, RESERVE AFFAIRS AND LOGISTICS

Rand
SANTA MONICA, CA. 90406

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PREFACE

This research was undertaken in response to concern among policymakers about the effect of proposed changes in the military retirement system on the supply of personnel to the military. In 1979 the retirement budget of over $10 billion constituted roughly one-third of the total budget cost of military personnel and about 9 percent of the total defense budget If the current retirement system is maintained, costs will continue to increase in constant dollars as the large Vietnam War cohorts reach retirement eligibility. The cost effectiveness of the current retirement system in attracting the desired number and quality of personnel has become a major policy issue, and several alternatives have been proposed. This report on second careers earnings loss of military retirees is one necessary input in the larger analysis of the supply response to changes in the retirement system.

A broader analysis of the military retirement system is reported in Richard V. L. Cooper's R-2493-MRAL, Military Retirees' Post-Service Earnings and Employment (forthcoming).

This report was prepared as part of Rand's Manpower, Mobilization, and Readiness Program. The research was sponsored by the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics).

SUMMARY

This report presents evidence on the civilian earnings of military retirees relative to noncareer veterans, using data from the 1970 Census. The objective is to provide some empirical evidence on the extent of second career earnings loss of military retirees. Second career earnings loss is defined as the difference between the potential civilian earnings of a military retiree, after a career in the military, and his counterfactual earnings--what his civilian earnings would have been had he not pursued a military career. A commonly cited rationale for the military pension is that skills acquired in the military are not fully transferable to the civilian sector. If so, the military retiree may experience some loss of earning potential on entering the civilian labor market in middle life, as a result of having spent the early part of his working career investing in military rather than civilian skills.

True second career earnings loss is necessarily unobservable. Actual civilian earnings of retirees may differ from potential civilian earnings because of choice of job characteristics, such as hours and location, that reduce nominal earnings but not real income or welfare. Counterfactual civilian earnings of retirees must be approximated by the actual earnings of a control group comparable to retirees in all respects relevant to earnings. In practice it is impossible to identify such a control group. The estimates may therefore be influenced to an unknown extent by differences in unobservable characteristics between the retirees and the control group.

The data base used here is drawn from the 1970 Census. Because the Census does not explicitly identify military retirees, we imputed retiree and noncareer veteran status to veterans on the basis of their age and the conflicts in which they had served. Internal and external checks provided reassurance that the samples are accurately identified and that the earnings comparisons are valid. However, it was not possible to identify all retirees. The sample is confined to men who retired between 1964 and 1969 and who were less than 60 years old in

1969. It is thus not a random sample but is restricted to younger cohorts who had recently entered the civilian sector. The sample is further restricted to persons employed at least 27 weeks in 1969, and conclusions cannot be extrapolated to retirees choosing not to work full time or to be self-employed.

On average, weekly wage rates of retirees are 10 to 20 percent lower than weekly wages of noncareer veterans. The difference varies by race and level of schooling. Among whites, the difference is smaller for high school dropouts than for high school or college graduates. For blacks, the retiree differential is generally smaller than for whites and is often positive, but the power of tests for statistical significance is low because of small samples.

Roughly half the white retiree differential in annual earnings is estimated to be attributable to differences in characteristics that are voluntarily chosen, such as years of schooling, hours of work, and location. The residual difference is a biased estimate of true second career earnings loss because of selection bias. In general, selection bias is expected to bias upward the estimate of second career earnings loss. To the extent that individuals select a military or civilian career on the basis of expected earnings, actual earnings of men who opted for a civilian career will tend to overstate the potential counterfactual civilian earnings of men who opted for a military career. Thus, the residual earnings differential of less than 10 percent, after voluntarily chosen, job-related characteristics are controlled for, is probably an upper bound on true second career earnings loss in the first years after entry to the civilian labor force. This in turn is probably an upper bound on life cycle second career earnings loss, if civilian skills are accumulated with years of experience in the civilian sector.

ACKNOWLEDGMENTS

The author would like to acknowledge the invaluable assistance of Rand colleagues David Chu, in planning and implementing this study; Richard V. L. Cooper, who contributed useful suggestions throughout the project; and Frank Camm and James R. Hosek, who provided valuable comments on an earlier version.

Computer programming was ably performed by Patricia Gowan, Franklin Berger, and Dolph Hatch.

The approach to earnings comparisons used here borrows heavily from that developed in Smith and Welch (1977).

CONTENTS

I. INTRODUCTION

This study was undertaken in response to concern among policymakers about the effect of proposed changes in the military retirement system on the supply of personnel to the military. In 1979, the retirement budget of over $10 billion constituted roughly one-third of the total budget cost of military personnel and about 9 percent of the total defense budget. If the current retirement system is maintained, costs will continue to increase, in constant dollars, as the large Vietnam War cohorts reach retirement eligibility. Thus the cost effectiveness of the current retirement system in attracting and retaining the desired number and quality of personnel has become a major policy issue, and several alternatives have been proposed. A complete analysis of the supply response to proposed changes in the retirement system is not attempted here. The more limited objective of this study is to provide empirical evidence on the second career earnings loss of military retirees, one necessary input in the larger analysis.

Second career earnings loss is defined as the difference between the *potential* civilian earnings of a military retiree, after a career in the military, and what his civilian earnings would have been had he not pursued a military career--his counterfactual earnings. The basic hypothesis (and one commonly cited rationale for the military pension) is that skills acquired in the military are not fully transferable to the civilian sector. If so, the military retiree may experience some loss of earning potential on entering the civilian labor market in middle life as a result of having spent the early part of his working career investing in military rather than civilian skills.[1]

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[1]The retiree's civilian earning power depends on both the amount and the transferability of skills acquired in the military. Thus, even if military skills are not fully transferable to the civilian sector, the retiree may suffer no second career earning loss if the *amount* of training received in the military exceeds the amount he would have received had he not pursued a military career.

Measurement of second career earnings loss is not straightforward because neither of the two components is directly observable. The *actual* second career earnings of a retiree understate his *potential* earnings to the extent he chooses to work shorter hours (because of the negative income effect of the pension on his labor supply) or locate in areas with low nominal earnings (to be close to a military base or to satisfy environmental preferences).

Measurement of the retiree's counterfactual civilian earnings, had he not served in the military, is even more problematic. Because counterfactual civilian earnings are unobservable, they must be approximated by the actual civilian earnings of a control group comparable to retirees in all relevant respects except the extent of service in the military. However, it is highly unlikely that the retirees and the control group are random samples from the same population. If career choice is affected by expected earnings in alternative occupations, then those with relatively high expected military earnings will opt for a military career and those with relatively high expected civilian earnings will opt for the civilian sector. In a comparison of the post service earnings of retirees with the civilian earnings of the control group, it is impossible to determine how much any observed wage differential is due to prior military experience--true second career earnings loss--and how much it is due to differences in the ability or tastes of the two groups. Such differences would have generated earnings differences even in the absence of a difference in military experience. Given adequate data, it would be possible to control for this selection bias and hence isolate true second career earnings loss. In practice, the available data do not permit this distinction. In the earnings comparisons presented here, differences in the characteristics of retirees and non-retirees are controlled for as much as possible. However, as estimates of second career earnings loss, they remain contaminated to an unknown extent by selection bias.

The earnings comparisons are based on data reported in the 1970 Census. The Census did not identify retirees explicitly; however, with information on veteran status and periods of service, it is possible to identify a group of "presumptive" retirees and a group of "presumptive"

noncareer veterans. The limited information permits idenfication of only retirees who left the service between 1965 and 1969. The resulting sample is thus not random. Nevertheless, for persons in their forties and early fifties, the identification procedure used probably distinguishes true retirees from veterans with shorter terms of service with sufficient accuracy to yield valid earnings comparisons. Confidence that the presumptive retirees are indeed true retirees is increased by the close correspondence between the findings of this study and those reported in Cooper (1979). Cooper's study is based on two data sets--the 1977 Department of Defense Retiree Survey and the 1977 Current Population Survey--which were not available at the time this study was undertaken. At that time the Census data were unique in providing information on the earnings of military retirees and a control group of other veterans.

Because of the fundamental importance of selection bias in estimating second career earnings loss, the nature of the problem and expected direction of the bias is discussed in Sec. II of this report. Section III contains a discussion of the data base. Section IV presents a simple comparison of the weekly wages of retirees relative to non-retirees by age, education level, and race. The observed patterns tend to confirm the suspicion that selection bias is a significant factor affecting observed wage differentials. In Sec. V multivariate regression analysis is used to identify the extent to which differences in annual earnings between retirees and non-retirees are attributable to chosen characteristics, such as weeks worked, education, location, and occupation. Appendix A discusses issues unique to veterans of World War II and Korea. Appendix B reports a comparison of the earnings of military personnel on active duty relative to the earnings of comparable civilians--active duty wage loss--which is a second necessary input in an analysis of the supply response to changes in the military retirement system.

II. SAMPLE SELECTION BIAS

Second career wage loss is the difference between two unobservables: the potential civilian earnings of a military retiree given his military experience, and what his potential civilian earnings would have been had he not pursued a military career. Hereafter this will be referred to as *counterfactual civilian earnings*. This section addresses problems in estimating such earnings.

Because counterfactual civilian earnings are unobservable, they must be approximated by the earnings of a group of civilians who are similar in all respects to the retiree population save only the extent of their military service. Unfortunately, given the data available, it is impossible to control for all differences between the two groups in characteristics affecting earning power. The omitted variables are likely to be correlated with choice of a military rather than a civilian career. If so, a comparison of the earnings of the two groups after the retirees join the civilian sector risks attributing any observed earnings differential to the fact of military service, whereas it may be due in part to unobservable differences in characteristics related to productivity. In other words, even if the retiree group had not served 20 years in the military, their civilian earnings at post-retirement ages might have been different from the earnings of the control group.

Such selectivity bias will exist to the extent career choice is motivated by (life cycle) earnings in alternative occupations. The individuals who choose a military career are probably those for whom the expected value of a military career exceeds the expected value of a civilian career. One then overestimates the potential civilian earnings of military retirees by using the civilian earnings of individuals who chose not to pursue a military career. Selection bias will be absent only in the unlikely event that career choice is motivated solely by factors other than earnings--for example, tastes for the nonpecuniary aspects of the two occupations. It is theoretically possible to control

for selection bias in earnings comparisons by simultaneous estimation of career choice and earnings, given adequate data.[1] However, the limited information contained in the 1970 Census does not permit identification of equations for both career choice and earnings. Thus we know that earnings comparisons are biased. The only question is in what direction and by how much, which depends on the nature of selection into the military.

If career choice is entirely voluntary--i.e., military wages are set to attract the required number of people and there is no nonprice rationing--then the direction of the selection bias is known. The earnings of the control group will be an upper bound on the potential earnings of retirees had the retirees not pursued a military career.

Figure 1 shows the frequency distribution of potential civilian wages of a group of individuals who are homogeneous in measurable characteristics, such as age and level of education, before the career decision.[2] Assume that potential military wages, W_M, are the same for all members of the group, that "tastes" for or against the military are either zero or independent of civilian wage levels and can be ignored, and that the civilian earnings of individuals at successive ages are positively correlated.[3]

If military wages are set at W_M^0, the Q_0 individuals whose potential civilian earnings are less than W_M^0 will volunteer for a military career. The mean of their counterfactual civilian earnings is $\bar{W}_{CF}^0$, which is less than $\bar{W}_V^0$, the mean of the civilian earnings of the group that opt against a military career because of higher civilian earnings. Thus, the difference $\bar{W}_V^0 - \bar{W}_{CF}^0$ is necessarily positive and is due to

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[1] See Willis and Rosen.

[2] The model applies at each career decision point: initial enlistment and each subsequent reenlistment decision. In this discussion we make the simplifying assumption that actual earnings in the civilian sector are equal to potential earnings. This ignores the possibility of a deviation of actual from potential earnings because of working part time, location, etc.

[3] The last assumption permits us to cast the problem in a single period and ignore the complications that arise if civilian earnings are negatively correlated across individuals over the life cycle.

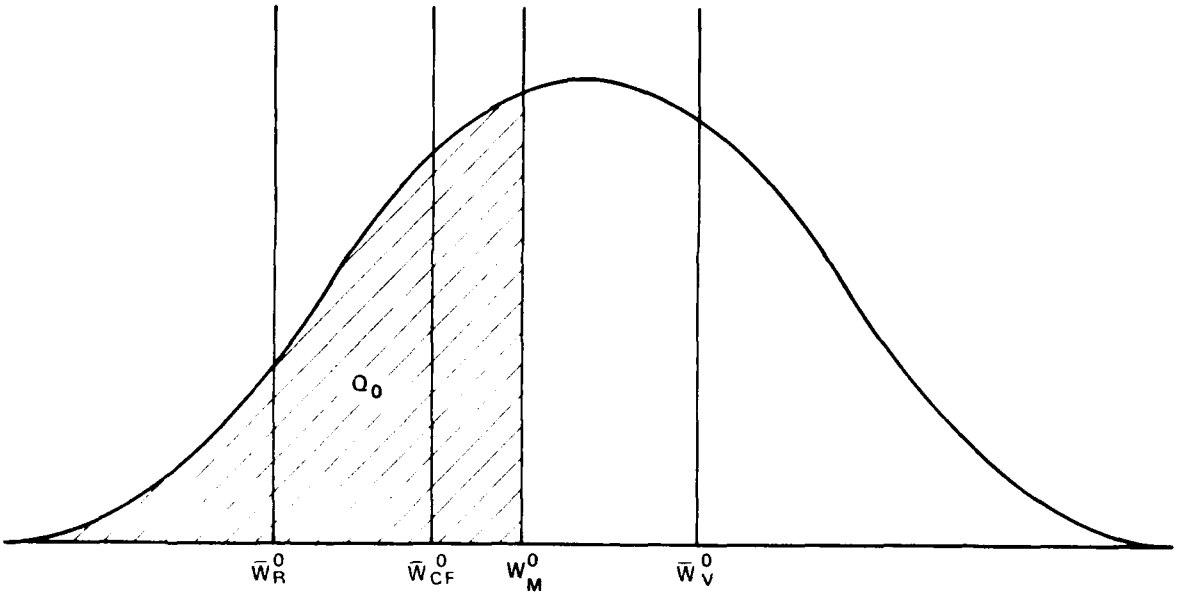

Fig. 1 — Selection bias with wage rationing only

unobserved differences between the potential civilian earnings of the two groups that accounted for their choice of different career paths. It is erroneous to attribute this to second career earnings loss. True second career earnings loss is the difference between counterfactual civilian earnings $\bar{W}_{CF}^0$ and potential earnings after a military career $\bar{W}_R^0$. Thus the measurement of second career earnings loss is necessarily biased upward by selection bias, if $\bar{W}_V^0$ is used to approximate $\bar{W}_{CF}^0$.

If the military engages in nonprice rationing of applicants, then signing the selection bias is more problematic. This is illustrated in Fig. 2. Assume that military wages are set above the level necessary to attract the requisite number of applicants--e.g., $W_M = W_M^1$. Then $Q_1 + Q_0$ individuals will volunteer for a military career. If the services wish to retain only Q_1, they can ration the limited number of places among the excess supply of applicants. If the screening tests select those individuals who are more productive in both the military and the civilian sectors, individuals with civilian wages less than

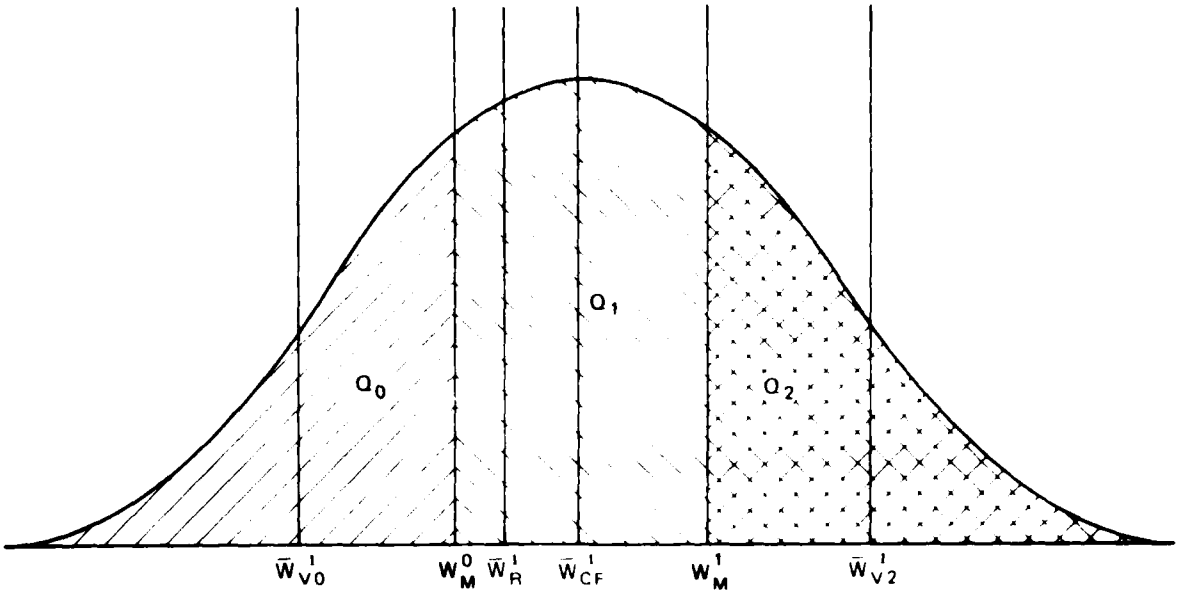

Fig. 2 — Selection bias with nonwage (quality) rationing

W^0_M will be rejected. The potential civilian earnings of the retiree group is now $\bar{W}^1_{CF}$. The civilian earnings of the control group is the average over two subgroups: $\bar{W}^1_{V0}$ for the Q_0 individuals who were (or would have been) rejected who have earnings earnings potential below that of the retiree group, and $\bar{W}^1_{V2}$ for the Q_2 individuals who did not apply and who have earnings potential greater than the retiree group. In a comparison of the average actual earnings of retirees $\bar{W}^1_R$ and the average earnings of the control group, therefore, *given nonprice rationing by the military*, the sign of the selection bias is ambiguous. It depends on the relative effects of groups Q_0 and Q_2 on the overall mean wage of the control group. The observed earnings differential may then over- or underestimate the true second career earnings loss of the retiree group that is attributable to service in the military as opposed to unobservable difference in quality.

To summarize, if there is no nonprice rationing by the military selection bias will tend to yield an overestimate of second career

earnings loss, if earnings of non-retirees are used as a proxy for counterfactual earnings of retirees. If there is nonprice rationing, even the direction of the selection bias is unknown. These conclusions are likely to hold even under less stringent assumptions than those used to develop the argument. Necessary and sufficient conditions depend on the precise form of the joint distribution of potential military and civilian wages, including true second career earnings loss, and tastes. Selection bias is absent only if career choice is independent of expected earnings or actual earnings are uncorrelated with expected earnings. Because neither of these conditions is likely to be met, selection bias cannot be ignored in comparing earnings of retirees and non-retirees.

In the absence of data on all characteristics relevant to both career choice and earnings, selection bias can be reduced if the control group is restricted to persons who served at least one term in the military. This eliminates two groups from the control group: first, those who failed (or knew they would fail) the mental and physical screening that occurs at entry to the military and whose civilian earning potential is likely to be less than that of the retirees; second; those who did not apply for the military because their expected civilian earnings exceeded their expected military earnings. The earnings of this group are likely to exceed the earnings of retirees.[1]

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[1]Unfortunately, the presence of the draft, which was in effect throughout the period when our sample was of draft age, reduces the efficacy of eliminating nonveterans as a control for selection bias. Some persons whose civilian earnings exceed military earnings were drafted but were likely to be among the first to leave. These people are now categorized as veterans, whereas in the absence of the draft they would probably not have entered the military. Their presence will tend to raise average earnings in the control group of noncareer veterans and hence bias upward the measure of second career earnings loss of retirees. This upward bias may be mitigated if the draft was also associated with a lowering of entry standards, such that the veteran population also includes some persons who were not eligible for reenlistment and whose civilian earnings are below the counterfactual civilian earnings of retirees who passed the reenlistment selection screens.

The remaining bias depends on self-selection by individuals at reenlistment and the extent of the services' selective retention policies, if they are faced with an excess supply of applicants. This bias is expected to differ across race and education groups. This subject will be discussed along with the estimates of relative earnings of retirees in Sec. IV.

III. THE DATA BASE

The data are drawn from the Public Use Samples of the 1970 Census. Unfortunately, respondents were not asked specifically how many years they had served in the military. However, in addition to veteran status, they were asked whether they had served during World War I, World War II, the Korean War and Vietnam Conflict, and whether they were on active duty in 1965. From the responses to these questions, individuals were classified into four military status categories corresponding to their presumed length of military service:

(i) Retirees: The criteria for classifying an individual as a retiree are the following:

Age: 37 years or more (37 - 20 = 17, = earliest age of voluntary enlistment

Military Service: World War II and Korea and either Vietnam or 1965, or Korea and Vietnam.[1]

(ii) Noncareer Veterans: Veterans of any other period or combination of periods are classified as noncareer veterans.[2]

(iii) Nonveterans: This group consists of men reporting no military experience. They are excluded from all the comparisons reported here.

(iv) Active Duty: Personnel on active duty in 1969.

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[1]The 1970 Census defines these periods of conflict as follows: World War II: September 1940 to July 1947; Korea: June 1950 to January 1955; Vietnam: August 1964- .

[2]This group presumably consists primarily of men who served only one term. However, it also includes some who served more than one term but less than a full career--inparticular, a large subset of men who served in both World War II and Korea. This group is discussed in Appendix A. Because they do not differ in job related characteristics from the remaining presumptive one-term veteran, these two groups were combined. The resulting sample was unnecessarily large in several age groups, so these were reduced by random subsampling. As a result, the final noncareer veteran sample is not random with respect to age.

These criteria identify as retirees men who were at least 37 in 1969, who left the military service between 1964 and 1969, and who had served in either or both Korea and World War II. These criteria thus cannot identify all retirees. To illustrate the age cohorts within which it is possible to identify retirees, Table 1 shows age in 1969, given hypothetical year of entry and length of service, for a typical officer and enlisted man. For example, men who retired between 1964 and 1969, having served a 20 year career, would have entered the service between 1944 and 1949. Enlisted men who entered during these years at the typical entry age of 19 would be aged 39 to 44 in 1969. Officers who entered during these years at the typical entry age for officers of 22 would be aged 42 to 47 in 1969. At the other extreme, men who retired between 1964 and 1969 having served a 30 year career would have entered between 1934 and 1939. Assuming entry at age 19, enlisted men would be aged 49 to 54 in 1969. Officers entering at age 22 would be 52 to 57 in 1969. Men serving intermediate career lengths (but entering at the modal ages) will fall within the age range 39 to 54 in 1969 for enlisted men and 42 to 57 for officers. Men entering the service either below or above the modal age at entry could fall outside these age ranges. Thus it is possible to identify enlisted retirees in age groups up to the mid fifties in 1969, officers in age groups up to the late fifties. Retirees in their late fifties or older in 1969 will be missed by the selection criteria and misclassified as noncareer veterans, unless they entered the service at an unusually late age or interrupted their period of service or served more than 30 years. To the extent true retirees are misclassified as noncareer veterans, the estimates of second career earnings loss are biased toward zero.

A comparison of the number of men identified as retirees with the actual increase in the number of retirees between 1964 and 1969 provides some reassurance that the selection criteria used do accurately distinguish retirees. The total number of retirees increased from 400,000 in 1964 to 700,000 in 1969. Assuming some attrition of the starting 400,000 this implies that over 300,000 men joined the retiree ranks between 1964 and 1969. The expected number of retirees in the three one-in-one hundred Census samples is therefore over 9,000, which comes

Table 1

ILLUSTRATIVE AGE, CAREER LENGTH, AND PERIOD OF SERVICE COMBINATIONS OF SAMPLE OF MILITARY RETIREES

Enlisted: Entry at 19 Years					Officer: Entry at 22 Years			
		Year of Retirement				Year of Retirement		
Age in 1969	Year of Entry	20 yrs	25 yrs	30 yrs	Year of Entry	20 yrs	25 yrs	30 yrs
39	1949	1969[a]						
40	1948	1968						
41	1947	1967						
42	1946	1966			1949	1969[a]		
43	1945	1965			1948	1968		
44	1944	1964	1969		1947	1967		
45	1943	1963	1968		1946	1966		
46	1942	1962	1967		1945	1965		
47	1941	1961	1966		1944	1964	1969	
48	1940	1960	1965		1943	1963	1968	
49	1939	1959	1964	1969	1942	1962	1967	
50	1938	1958	1963	1968	1941	1961	1966	
51	1937	1957	1962	1967	1940	1960	1965	
52	1936	1956	1961	1966	1939	1959	1964	1969
53	1935	1955	1960	1965	1938	1958	1963	1968
54	1934	1954	1959	1964	1937	1957	1962	1967
55	1933	1953	1958	1963	1936	1956	1961	1966
56	1932	1952	1957	1962	1935	1955	1960	1965
57	1931	1951	1956	1961	1934	1954	1959	1964
58	1930	1950	1955	1960	1933	1953	1958	1963
59	1929	1949	1954	1959	1932	1952	1957	1962
60	1928	1948	1953	1958	1931	1951	1956	1961

[a]Blocked section shows age and career-length combinations of identifiable retirees, assuming typical entry ages and three possible career lengths.

close to the 10,522 actually identified by the selection criteria.[1] Confidence in the selection criteria is enhanced by the comparison of the characteristics of the presumptive retirees and noncareer veterans, presented below, which conforms to prior expectations in many ways.[2]

[1]One-third of this sample--records drawn from the Neighborhood Census sample--had to be dropped from the analysis because the Neighborhood Census questionnaire does not identify state of respondent.

[2]The estimates of retiree earnings differentials are also remarkably close to those found by Cooper (1979) using the 1977 DoD Retirement Survey and 1977 Current Population Survey.

Although this sample is not representative of older cohorts of retirees, it does provide valuable evidence on the civilian earnings of younger retirees. These younger cohorts constituted a significant fraction of the total retiree population--roughly half in 1969. Moreover, second career earnings loss for the younger cohorts who have recently joined the civilian sector should provide an upper bound on the earnings loss of older cohorts, who have had time to acquire civilian skills.[1]

From the samples of retirees and noncareer veterans, subsamples were selected restricted to persons employed full time (27 weeks or more) in 1969.[2]

Specifically, the criteria for including a record from the analysis sample were:

Employed during the reference week (1970)--excludes persons unemployed, self-employed, or not in the labor force.[3]

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[1]Evidence from Cooper (1979) confirms this.

[2]The reported earnings of persons who choose to work less than full time obviously understate their potential full time earnings. Voluntary choice of more leisure and shorter working hours is expected to be more common among retirees than noncareer veterans for three reasons. First, the positive income effect of the military pension increases demand for leisure. Second, to the extent there is second career earnings loss, a lower wage offer induces a substitution effect toward more leisure. Third, the GI Bill subsidizes formal schooling. Retirees with a relatively large pension and who select out of the full time civilian labor force because of an income effect are those who were productive relative to the average in the military and possibly would have been productive relative to the average in the civilian sector. Excluding them from the sample will bias upward the estimate of second career earnings loss. Exclusion of retirees selecting out of the full time civilian labor force because of relatively large true second career earnings loss will tend to bias the estimate downward. The net bias is uncertain. As a result, conclusions based on the sample of retirees working full time cannot be extrapolated to retirees excluded from the sample because they chose to work less than full time.

[3]The self-employed are excluded from the sample because other studies have concluded that the reported earnings of the self-employed tend to be the gross income of their business, which includes returns to other factors in addition to the imputed wages of the entrepreneur. No constraint was placed on the number of hours worked per week because the hours per week reported in the Census refer to hours worked in the

Worked 27 weeks or more in 1969.

Eight years or more of schooling completed.

Race either white or negro.

Earnings in 1969 of at least $500.[1]

Computed experience non-negative.[3]

Resident of continental U.S.--excludes Hawaii and Alaska.

Age between 37 and 60.

Census reference week, in 1970, not the average number of hours per week worked in 1969, which is the period for which earnings are reported.

[1]This is an arbitrary cutoff point, based on the calculation that 27 weeks at 20 hours a week at $1 an hour would yield earnings of $540.

[2]Work experience is estimated as: Current Age - Years of Schooling - 6.

IV. COMPARISON OF AVERAGE WEEKLY WAGE RATES

Table 2 compares the average weekly wage rates of retirees relative to noncareer veterans, stratified by race, age, and level of schooling.[1] By these estimates, white retirees typically earn 10 to 20 percent less than noncareer veterans; for blacks, the retiree relative wage typically exceeds one, but the difference is not statistically significant because of small sample size.

This comparison of actual weekly earnings is an imperfect measure of second career earnings loss. The ideal measure of potential earnings would be based on the wage rate offered for full time work (hours per week and weeks per year) with no on-the-job investment in human capital (OJT). Actual earnings of retirees are expected to fall short of potential earnings for several reasons. First, retirees typically work shorter hours per week than noncareer veterans (see Table 3). Thus, the weekly wage differential overstates the hourly wage differential. Second, an employer's wage offer per hour is expected to be less for a shorter work week, if there are fixed costs of employment. If so, the retiree implicitly chooses a lower hourly wage rate by choosing a shorter work week. Third, the retiree's optimal investment in OJT may be greater than that of noncareer veterans of comparable age and schooling level, particularly immediately upon entry to the civilian labor force.[2]

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[1] Weekly wages are computed as annual earnings (wage and salary income, gross of tax) in 1969 divided by weeks worked, for each individual.

[2] Predictions with respect to optimal investment in OJT for retirees relative to noncareer veterans are ambiguous. On the one hand, to the extent the retiree has a lower stock of civilian human capital because of his time in the military, his opportunity cost of investing (forgone civilian wage) is lower. On the other hand, if his efficiency at investing is reduced by as much as his efficiency at earning, his expected return to investment in OJT, hence his optimal investment, is no higher than that of noncareer veterans. Furthermore, the military pension tends to reduce the retiree's optimal supply of labor and hence his optimal accumulation of human capital. It is an empirical question which of these effects dominates. Cooper (1979) finds that the relative earnings of retirees are lower in the first years after they enter the civilian labor market, which is consistent with a high initial

Table 2

CIVILIAN WAGES OF RETIREES, RELATIVE TO NONCAREER VETERANS, BY RACE AND EDUCATION LEVEL

Age	Some High Graduate	High School Graduate	Some College	College Graduate
		Whites[a]		
37-41	.90	.86	.89	.93
42-46	.93	.83	.79	.85
47-51	.91	.86	.88	.88
52-60	.91	.77	.85	.81
		Blacks		
37-41	.95	1.00	1.00	1.05
42-46	.90	1.08	1.33	1.18
47-51	1.10	.96	1.04	1.06
52-60	.87	1.07	1.42	(b)

[a]Significantly different from one at the 5 percent level.

[b]Fewer than five observations.

Fourth, retirees choose to locate in areas of the country where nominal wage rates are relatively low. Thus, choice of hours and location (and possible OJT) all imply that wage ratios in Table 2 overstate true second career earnings loss.

An additional bias due to selection is more difficult to sign, as discussed in the previous section. For a given distribution of counterfactual civilian earnings, second career earnings loss would be overestimated more the smaller the fraction of the cohort that served a

investment in OJT. However, if one could eliminate any downward bias in the measurement of second career earnings loss because of investment in OJT upon entry to the civilian labor market, one should in principle subtract out the return on this investment in later years. In other words, initial investment in OJT will lead to an overestimate of second career wage loss during the period of the investment and an understatement during the period of the returns on the investment.

military career and the less the services rationed on the basis of quality from an excess supply of applicants. Casual evidence that is hard to document suggests that the military has generally faced an excess supply of blacks relative to whites, and among whites, high school graduates have been in shortest supply.[1] The military is hypothesized to have selected the relatively more able white high school dropouts and blacks of all schooling levels. This implies that among whites negative selection bias is least for high school dropouts, and negative selection bias is generally less for blacks than for whites and may be positive. The wage ratios in Table 2 are consistent with this hypothesis. For white high school dropouts, retiree earnings are less than 10 percent lower than earnings of noncareer veterans in three of the four cells. For blacks, retiree earnings typically exceed noncareer veteran earnings.

This pattern of earnings ratios, by schooling level and race, tends to confirm the suspicion that selection bias may seriously contaminate estimates of second career earnings loss. It is not a perfect test of the extent of the bias by race and schooling level for two reasons. First, prediction with respect to the pattern of relative wages across groups presupposes the same dispersion of counterfactual civilian earnings for the groups under comparison. More realistically, the dispersion of earnings is expected to increase with level of schooling. Then, given a constant proportion of each schooling cohort serving a military career, observed wage ratios computed as in Table 2 would be expected to decrease by schooling level. Second career earnings loss would *appear* to increase with schooling, despite identical selection bias. Thus human capital theory, rather than rationing on the basis of quality by the services, could account for the smaller retiree wage differential of white high school dropouts relative to whites with more education. However, the finding of a smaller wage differential for white college graduates than for high school graduates is inconsistent with the human capital model, as is the pattern for blacks.

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[1]The evidence on activity duty wage loss presented in Appendix B is consistent with this.

This comparison of the average earnings of retirees and noncareer veterans shows that retirees who worked full time earned 10 to 20 percent less during their first five years in the civilian sector. This is an upward biased estimate of true second career loss, because of differences in hours, location, etc. In the following sections, we attempt to control for this bias. However, the estimates are subject to further bias, of unknown direction and magnitude, because of unobservable characteristics associated with career choice and subsequent earnings. The evidence is consistent with the hypothesis that the bias (underestimate of true second career loss) is smallest for white high school dropouts and blacks, because the military selected the most able individuals in these groups; the bias (overestimate of true second career earnings loss) is largest for white high school graduates, where the military is least able to select from an excess supply. Lack of other than casual evidence on the extent to which these groups were in excess supply and the selection criteria used by the services during the relevant periods makes this conclusion tentative. However, the evidence in Appendix B on military wages by schooling level is consistent with it.

V. MULTIVARIATE ANALYSIS

In this section multivariate analysis is used to estimate the extent to which observed earnings differentials are attributable to differences in job-related characteristics of retirees and noncareer veterans on one hand, and differences in the return to those characteristics on the other.

DEFINITION OF VARIABLES

Earnings: Income from salary, wages, commissions, bonuses, or tips from all jobs (before deductions of taxes, dues, etc.) in 1969, inclusive of sick leave pay.

Weeks: Number of weeks worked in 1969.

Hours: Number of hours worked in the week before the survey, in 1970.

School: Years of high school completed.

High School Graduate: Dummy variable = 1 if at least 12 years of high school completed.

College: Years of college completed.

College Graduate: Dummy variable = 1 if at least four years of college completed.[1]

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[1]The specification and interpretation of the education variables is based on human capital theory. This theory views an individual's decision to attend school as a decision to invest in his human capital. It will be made on the basis of rational investment criteria. Under certain restrictive assumptions, in an equation of the form:

$$\ell n\ Y = \alpha + \beta S + u\ ,$$

where $\ell n\ Y$ = natural logarithm of earnings,
S = years of schooling completed,

the coefficient β measures the rate of return to each additional year of schooling. This simple linear form may be modified to test the hypothesis that the rate of return to additional years of schooling is not constant.

Two sets of education variables were considered. The first is a set of dummy variables: high school graduate (12 years of schooling completed), some college (13 to 15 years of schooling completed, college graduate (16 years of schooling completed), and postgraduate (17

In School: Dummy variable = 1 if currently attending school.

Experience: Years of work experience, computed as: Experience = Age - Schooling - 6.[1]

Location: Three dummy variables indicate location in the north central, south, and west regions of the country. The omitted category is the northeast.

SMSA: Dummy variable for location in a standard metropolitan statistical area.

Feds: Dummy variable = 1 if employed by the federal government.

State and Local Government: Dummy variable = 1 if employed by state or local government.

Government Purchases: Purchases of federal, state, or local government, relative to value added in the industry.

DoD Purchases: Purchases of the Department of Defense, relative to value added in the industry.

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or more years of schooling completed). The omitted category is some high school (8 to 10 years). This specification allows the rate of return to additional years of schooling to be a discontinuous function.

An alternative specification is a continuous spline function consisting of two segments: the first corresponding to years of high school completed and the second corresponding to years of college completed. The two sections are constrained to join by setting the number of years of high school equal to 12, for those with a college education. The implication of this specification is that the rate of return to additional years of high school or college may differ but is the same for all years of high school or college. For example, the rate of return to completing the 12th grade and getting a high school diploma is the same as the rate of return to completing the 11th grade.

The specification that appears to fit the data best is a combination of these two alternatives. In the final regressions reported here the spline function is used but dummy variables are included for graduation from high school and college. This allows for a higher marginal return to graduation than to completing other years.

Under more realistic assumptions about the determinants of schooling, the schooling coefficient cannot be interpreted at a simple rate of return. See, for example, Rosen and Willis, 1978.

[1]For persons who attended school while working--either in the military or the civilian sector--experience implicitly subtracts these years from work experience and hence imparts a downward bias to the estimate of work experience. Unfortunately, date of leaving the military and hence length of civilian experience are not known.

These last two variables are designed to test whether retirees have skills that are particularly valuable in industries that sell a large fraction of their output to government in general or the Defense Department in particular.

Professional/Administrative/Managerial: Dummy variable = 1 if occupation is professional, technical, managerial, or administrative.

White Collar: Dummy variable = 1 if occupation is professional, administrative, technical, managerial, sales, or clerical. The omitted occupational category includes craftsmen, operatives, transport, farm, service, and domestic workers.

DoD Purchases × Administrative/Managerial: Interaction between the Defense Department Purchases variable and the dummy variable denoting professional, administrative, technical, and managerial occupation. This is designed to test whether managerial skills of retirees are particularly valuable to defense contractors.

Unionization: Percentage of the unionized labor force in the industry.

Military Base: Number of active duty personnel in the state. This is designed to test the hypothesis that retirees are prepared to accept a lower wage to locate near a military facility and take advantage of hospital and commissary privileges.[1]

Years in Current Residence: Years in current residence was tried as a proxy for years in current employment, to test the hypothesis that earnings are positively related to time in current employment, because of job-specific skills. The coefficient was insignificant and the variable therefore dropped from the final regressions reported here.

COMPARISON OF MEANS

Table 3 gives the means and standard deviations of the variables included in the regression analysis, for retirees and noncareer veterans, stratified by race. Weeks and hours are reported separately for

[1] We tried including number of military hospital beds in the state, to test for a differential pull of medical as opposed to commissary privileges. High correlation with the personnel variable precluded identification of separate effects.

Table 3

MEANS AND STANDARD DEVIATIONS OF CHARACTERISTICS OF RETIREES AND NONCAREER VETERANS BY RACE

Variables Included in the Regression Analysis	Whites				Blacks			
	Noncareer Veterans		Retirees		Noncareer Veterans		Retirees	
	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ
School	12.4	2.9	12.6	2.3	11.3	2.5	12.1	2.1
Age	48.8	7.6	44.9	5.9	46.3	6.6	43.9	5.6
Earnings	10,651	6,711	9,187	4,965	6,818	3,446	7,323	3,745
Weekly wage	210	131	185	99	137	69	146	71
Years in current residence	8.7	7.3	3.4	4.6	7.7	7.1	4.1	5.5
Experience	30.4	8.3	26.4	5.9	29.0	7.3	25.8	5.7
Percent union	30.0	17.0	28.6	16.4	32.5	18.4	29.8	16.9
Military personnel	69,200	82,726	96,751	92,883	73,269	73,654	109,640	99,087
Military beds	1,765	2,032	2,341	2,291	1,784	1,805	2,765	2,404
DoD purchases/value added	7.0	17.4	8.9	21.2	5.9	13.9	8.3	19.1
Government purchases/value added	16.6	25.2	16.9	26.8	15.3	22.2	14.8	22.9
DoD purchases × administrative/managerial	0.3	2.4	0.4	3.2	0.0	1.0	0.1	0.6
North Central	28.1	44.9	13.3	34.0	25.8	43.7	12.3	32.9
West	18.7	39.0	27.8	44.8	9.6	29.5	27.8	44.8
South	24.5	43.0	40.1	49.0	35.2	47.7	32.9	47.0
In school	0.9	9.6	2.6	16.1	1.2	10.9	4.1	19.8
Professional/administrative/managerial	33.8	47.3	34.7	47.6	12.4	32.9	18.9	39.1
White collar	51.0	49.9	55.8	49.6	24.8	43.1	36.0	48.0
Federal government employee	9.5	29.4	24.4	42.9	15.7	36.3	31.6	46.4
State/local government employee	12.7	33.3	12.8	33.4	14.8	35.5	14.0	34.7
SMSA	58.2	49.3	61.2	48.7	68.9	46.2	70.7	45.4
Weeks worked 1969: Officers[a]	50.7	3.9	49.6	5.5	49.1	5.7	50.5	4.3
Enlisted[b]	50.6	4.1	50.1	4.8	49.8	4.8	49.7	4.8
Hours per week: Officers[a]	42.1	11.6	39.0	15.5	39.5	11.7	40.2	12.5
Enlisted[b]	40.2	12.8	38.8	14.6	37.2	13.8	36.5	14.9

[a]College graduates: n = 15,256 white vets; n = 648 white retirees; n = 760 black vets; n = 24 black retirees.

[b]High school dropout and high school graduates: n = 43,952 white vets; n = 3129 white retirees; n = 7039 black vets; n = 213 black retirees.

presumptive officers (college graduates) and presumptive enlisted men (high school dropouts and graduates). A comparison of the average characteristics of retirees and other veterans makes it clear that the retiree population does differ in certain predictable ways from the control group, which lends credence to the criteria used for identifying the retiree sample from the original data base.

Table 3 indicates that the difference between earnings of retirees and veterans may be accounted for in part by differences in characteristics other than military experience, although not necessarily unrelated to military experience. Retirees typically have lower means but larger standard deviations of weeks worked and hours per week than noncareer veterans, although differences are not large in this sample confined to men working at least 27 weeks. Although white retirees have an average level of schooling similar to that of other veterans, a finer breakdown (not shown in Table 3) reveals that this average conceals the fact that the white retiree schooling distribution is more compressed at both tails--fewer with less than a high school diploma and fewer with postgraduate education. For blacks, the average level of schooling for retirees is significantly above that of the other veteran population. Mean age and experience in these samples of retirees and noncareer veterans do not indicate population means for either group, because neither sample was constructed as a random sample by age.

Differences in location are consistent with expectations. Retirees have moved more recently to their current place of residence. Both white and black retirees tend to be disproportionately concentrated in the west, and white retirees are also more concentrated in the south. Black retirees, by contrast, locate less in the south and more in the northeast than other black veterans. The tendency to locate in the west and south reflects in part a choice of location close to a military base in order to take advantage of medical, commissary, and PX privileges. Mean values of the two variables that measure the size of military establishment in a state, active duty personnel, and military hospital beds are larger for retirees than for other veterans.

The industrial distributions of retirees and other veterans also show some predictable differences. For both races the proportion of

retirees working for the federal government is at least twice as large as for other veterans: 24.4 percent versus 9.5 percent for whites, 31.6 versus 15.7 percent for blacks. However, there is no appreciable difference in the proportions working for state and local government. Retirees are disproportionately employed in industries for which the Department of Defense is a major client. If the comparison is based on all government purchases, rather than purchases by the Department of Defense only, the distribution of retirees is no different than that of other veterans. This suggests that the tendency of retirees to be overrepresented in defense-related industries is offset by relative underrepresentation in industries that supply other branches of government.

The occupational distribution of white retirees shows a slightly larger percentage in white collar jobs. For blacks the difference is much more pronounced, with 36 percent of retirees in white collar occupations, compared with 24 percent for noncareer veterans. Retirees are also slightly more likely to be located in urban areas. Finally, the percentage of the population attending school is roughly three times as large for retirees as for other veterans, although the absolute percentages are small: 4.1 percent for black retirees and 2.6 percent for white retirees.

REGRESSION ANALYSIS OF ANNUAL EARNINGS

The underlying model assumes that annual earnings may be written as the product of earnings per hour, hours worked per week and weeks worked per year or, in log form:

$$\ell n\ AE = \ell n(W|Y) + \ell n(H|W) + \ell n(E|H)\ , \qquad (1)$$

where AE = annual earnings

$W|Y$ = weeks worked per year

$H|W$ = hours worked per week.

Earnings per hour are a function of a vector of variables that includes characteristics affecting earnings potential--such as schooling, experience, and ability--and characteristics of the job--such as location, government or private employer, unionization, etc.

$$\ell n(E|H) = Z\alpha + \varepsilon, \ \varepsilon \sim N(0,\sigma) \ . \qquad (2)$$

Substituting Eq. (2) in Eq. (1) yields:

$$\ell n \ AE = \ell n(W|Y) + \ell n(H|W) + Z\alpha + \varepsilon \qquad (1')$$
$$= X\beta + \varepsilon \ .$$

If earnings per hour are also affected by number of hours worked per week and weeks worked per year, then coefficients on weeks and hours in Eq. (1') may differ from unity.

To test for significant parameter differences between retirees and noncareer veterans a vector of variables formed by interacting retiree status was included with the explanatory variables. Thus the equation to be estimated is of the form:

$$\ell n \ AE = X\beta + d_R X\gamma + \varepsilon \ , \qquad (1'')$$

where d_R = 1 for retirees
0 for noncareer veterans.

With this specification, β is the coefficient vector for noncareer veterans. The interaction vector, γ, measures coefficient differentials between retirees and other veterans; t-statistics on the components of the γ vector test for statistical significance (from 0) of a differential effect for retirees. The net coefficient vector for retirees is thus $\beta + \gamma$.

For whites, the sample is subdivided by years of work experience in order to allow coefficients to vary by level of experience.[1] For

[1] Mincer (1974) has shown that, comparing persons of different levels of school, the rate of return to experience is similar at common levels of experience rather than at common ages. In other words, the effect of additional years of schooling is (partly) to shift the experience earnings profile forward in time. Consequently, a mean rate of return to experience, over individuals with different levels of schooling, is more efficiently calculated if the sample is subdivided by years of experience rather than by age.

blacks, the smallness of the retiree sample precludes subdivision. The cost of pooling is to obtain less efficient estimates, if coefficients do indeed vary by level of experience. Because of the small sample of blacks, the following discussion is based on whites only.

Table 4 reports two estimated equations for each experience group. In the first equation, all coefficients are allowed to differ for retirees relative to noncareer veterans. The retiree interaction, γ, is indicated by the R-coefficient below each variable. The net retiree coefficient is thus the sum of the main coefficient and the R differential. In the second equation, retiree coefficients are allowed to differ only on a subset of variables, selected on the basis of either estimated significance in the first equation or specific theoretical reasons for expecting a retiree differential. Coefficients on the remaining variables are constrained to be equal for retirees and other veterans.

Hours and Weeks: The coefficients on hours and weeks are expected to equal unity if hours and weeks are independent of earnings per hour. A more realistic model would recognize that the observed wage rate, hours per week and weeks per year, are simultaneously determined by the interaction of supply and demand functions relating hours to hourly wage rate. Ideally, hours and weeks should be treated as endogenous variables and estimated simultaneously with hourly wage rate. The data available in the Census are insufficient to identify a simultaneous system.

In the single equation estimates presented here, the coefficients on hours and weeks permit no simple interpretation because they compound three underlying structural parameters: (1) a demand effect and (2) a substitution effect on the supply side, both of which are expected to be nonnegative; and (3) a negative income effect on the supply side. Only the income effect is expected *a priori* to differ for retirees, compared with the control group, because of the military pension. Thus, if the income effect is significant relative to the other two positive effects, the hours and weeks coefficients are expected to be lower for

Table 4

REGRESSIONS OF ANNUAL EARNINGS (LOG_e), WITH FULL AND PARTIAL RETIREE INTERACTION

	Whites						Blacks	
	Experience 21-25		Experience 26-30		Experience 31-40		Experience 21-40	
HOURS AND WEEKS								
Hours (Log_e)	.008	.008	.007	.005	.002	.002	.013	.010
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	.005		-.017		-.013		-.006	
	[illegible]		[illegible]		[illegible]		[illegible]	
Weeks (Log_e)	1.180	1.178	1.108	1.115	1.140	1.143	.880	.894
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	-.350	-.324	-.268	-.363	-.524	-.623	.155	.113
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SCHOOLING AND EXPERIENCE								
School	.036	.035	.030	.032	.024	.024	.012	.017
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	-.050	-.037	-.002	-.034	-.039	-.037	.007	-.004
	-5.94	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.63	-.46
High School Grad	.043	.047	.031	.021	.031	.032	.046	.027
	3.78	4.99	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.52
R	.038		-.137		.012		-.052	
	[illegible]		-3.73		[illegible]		[illegible]	
College	.080	.081	.075	.074	.069	.069	.065	.066
	26.54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8.62
R	.031	.011	-.005	.017	.037	.027	-.001	-.011
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-1.04
College Grad	.067	.059	.031	.028	.036	.031	.061	.016
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.44
R	-.192		-.063		-.137		-.175	
	[illegible]		[illegible]		[illegible]		[illegible]	
In School	-.070	-.061	-.083	-.086	-.141	-.142	-.050	-.051
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	.063		-.054		-.021		.009	
	[illegible]		[illegible]		[illegible]		[illegible]	
Experience	.005	.005	.002	.002	-.009	-.009	-.003	-.003
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-1.23
R	-.015	-.016	-.006	-.005	.004	.002	-.002	-.002
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-.545	[illegible]
LOCATION								
North Central	-.024	-.025	-.019	-.019	-.012	-.012	.040	.036
	[illegible]	-2.88	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.51
R	-1.32		-.010		.011		-.009	
	[illegible]		[illegible]		[illegible]		[illegible]	
South	-.161	-.158	-.157	-.156	-.163	-.160	-.303	-.301
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	.029		.012		.055		.001	
	[illegible]		[illegible]		[illegible]		[illegible]	
West	-.099	-.095	-.105	-.100	-.081	-.082	-.058	-.045
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	.080		.058		.010		.037	
	[illegible]		[illegible]		[illegible]		[illegible]	
SMSA	[illegible]	.100	.122	.128	.113	.114	.081	.086
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	-.032	-.031	-.083	.112	[illegible]	[illegible]	.033	-.007
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 4--continued

	Whites						Blacks	
	Experience 21-25		Experience 26-30		Experience 31-40		Experience 21-40	
INDUSTRY AND OCCUPATION								
Feds	-.062	-.063	-.060	-.061	-.030	-.030	.098	.092
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.47
R	.063	.067	.067	.085	.028	.077	-.014	-.000
	1.98	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-.44	[illegible]
State & Local Govt	-.124	-.125	-.134	-.133	-.119	-.119	.081	.086
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	.092	.097	.035	.017	.002	-.005	-.031	-.039
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Government Purchases	.121	.117	.144	.136	.093	.088	.037	.059
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	-.073		-.216		-.156		.056	
	[illegible]		[illegible]		[illegible]		[illegible]	
DoD Purchases	-.081	-.074	-.118	-.108	-.056	-.054	.126	.100
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.64
R	.213	.126	.323		.256	.107	.002	.076
	[illegible]	[illegible]	[illegible]		1.79	1.47	[illegible]	[illegible]
White Collar	.042	.044	.042	.043	.066	.066	.016	0.30
	2.87	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.45
R	-.024	-.035	-.042		-.088	-.087	.079	.046
	[illegible]	-1.48	[illegible]		[illegible]	[illegible]	[illegible]	2.64
Professional/Admin/ Managerial	.163	.159	.209	.209	.230	.230	.217	.190
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	-.021		-.006		.021		-.079	
	-.67		-.26		.45		-1.44	
DoD Purchases × Admin/Managerial	.151	.139	.224	.205	.165	.170	.271	.282
	[illegible]	[illegible]	3.43	[illegible]	[illegible]	[illegible]	.64	.90
R	-.126		-.108		.045		.437	
	[illegible]		[illegible]		[illegible]		.37	
Percent Union	.249	.248	.289	.291	.356	.359	.508	.547
	11.54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	19.06
R	-.002		.034		.168		.086	
	[illegible]		[illegible]		[illegible]		1.40	
MILITARY BASE								
Military Base	.5D-6	.5D-6	.5D-6	.5D-6	.5D-6	.5D-6	.2D-6	.1D-6
	8.63	8.55	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.93
R	-.2D-6	-.1D-6	-.3D-6	-.1D-6	-.2D-6	-.2D-6	-.2D-6	-.4D-6
	-1.36	-.86	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C	3.700	3.710	4.097	4.056	4.354	4.343	4.928	4.821
	[illegible]	21.40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	2.150	1.940	1.330	1.923	2.482	2.770	-.609	-.331
	4.46	4.13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-.64
R^2	.320	.320	.296	.295	.269	.268	.276	.275
SEE	.435	.435	.453	.453	.463	.463	.467	.467
n Veterans	17,130		17,650		26,563		4,501	
n Retirees	1,820		1,3[illegible]		87[illegible]		188	

retirees than for other veterans. The observed coefficients are consistent with this.[1]

Schooling: For noncareer veterans, the return to schooling is roughly 3 percent a year, with an additional 3 percent accruing to graduation from high school. The size and significance of these coefficients diminish with age. For retirees, there appears to be a negative 3 percent differential (zero net return) in the return to high school, including graduation.[2] Note that this implies that the marginal return to additional years of schooling is less for retirees, not that the *average* return is lower. This finding is consistent with the hypothesis that the military selects the more able high school dropouts and perhaps the less able high school graduates, so that the ability differential between high school graduates and high school dropouts in the military is less than among the veterans. Such an unobserved ability differential will tend to bias downward the estimated return to schooling for retirees.

For noncareer veterans, the returns to attending college are estimated at 7 to 8 percent a year for whites, with an additional 3 to 6 percent premium for graduating. For retirees, the estimates are very sensitive to the specification. In the unconstrained estimates, a higher rate of return per year is offset by a lower return to graduating. In the constrained estimates, the average rate of return to additional years of college is 1 to 2 percent higher for retirees. This is consistent with either or both smaller second career wage

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[1] In regressions not reported here, we regressed the log of average weekly wages on the other explanatory variables included in Table 4. Effectively, this specification constrains the coefficient of weeks to unity and suppresses (without solving) the problem of endogeneity of weeks and hours. All coefficients were very similar to those reported in Table 4, both in magnitude and significance, with the exception of the constant interaction for retirees, which was still positive but less than unity.

Coefficients of hours are probably biased by measurement error, since hours reported are hours worked in the reference week, not average hours per week in 1969.

[2] The graduation interaction is suppressed in order to obtain a more efficient estimate of the differential return to high school, because the School and High School Graduate variables are highly correlated.

loss for officers than enlisted men and selection of the more able among college graduates than among high school graduates.[1]

Persons currently attending school have significantly lower earnings, but there is no differential between retirees and other veterans.

Experience: For noncareer veterans, the coefficients on experience show the expected pattern. The predicted rate of return to additional years falls from .5 of 1 percent in the youngest group to .1 of 1 percent in the oldest group. This is consistent with the familiar inverted U-shaped age/earnings profiles.[2] The theory that retirees would invest more than other veterans in OJT on entry into the civilian labor market predicts that the retiree differential should be greater in the youngest experience groups, assuming average civilian experience of retirees increases across experience groups. This is not borne out. In general, the experience coefficients are not significantly different for retirees, except in the youngest experience class, where the estimated rate of return to retirees is 1 to 2 percent lower than for other veterans. However, this is not a fair test of the OJT hypothesis, which requires precise data on experience in the civilian sector that are not available in the Census.

Location: The region dummies show a pattern of lower wages in all regions of the country relative to the northeast, with wages roughly 17 percent lower in the south and 10 percent lower in the west. There are no significant differentials for retirees. The estimates for the south and west are affected by inclusion of the military base variable, which tends to act as a proxy for California and Texas because of the large military establishments in these states relative to all other states. If the military base variable is omitted, the differential is reduced to 13 percent for the south and 4 percent for the west.

The military base coefficients are significantly positive for noncareer veterans, presumably because incomes are high in California and

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[1] It is also consistent with diminishing returns to additional years of college, and a lower mean number of years of college for retirees (see Table 3).

[2] We tried including the square of experience to test for nonlinearity in the returns to experience. It was generally insignificant and was therefore dropped.

Texas relative to the other states in these regions. The retiree interaction is consistently negative in the unconstrained equation, consistent with the hypothesis that retirees would accept a lower wage in order to locate near a military base. The significance level is reduced in the constrained equation, dropping regional interaction, presumably because the military base variable then captures all the other weak regional differentials of retirees.

Whereas other veterans earn 10 to 13 percent more if they reside in an SMSA, the retiree differential is significantly (3 to 12 percent) lower. There is no obvious explanation for this effect, except perhaps that retirees tend to locate in the smaller urban areas, where the urban wage differential is smaller.

Industry: The persistently negative coefficient of 3 to 6 percent on employment by the federal government for veterans is inconsistent with findings of other studies.[1] The difference is probably accounted for by the fact that this study controls for white collar occupations and unionization, both of which are positively correlated with federal employment.

For retirees, by contrast, the federal employment differential is significantly positive and large enough (6 to 8 percent) to offset the negative coefficient for noncareer veterans. Thus retirees apparently earn a premium in federal employment, compared with other federal employees. In state and local government, however, there is no consistent difference between retirees and noncareer veterans.

The effects of employment by government contractors are also consistent with prior expectations. Employment by government contractors (all branches of government) commands a premium that does not differ between retirees and other veterans. Relative to this, earnings in defense contracting industries are higher for administrative and managerial personnel but lower for other employees. Retirees earn more than other employees of defense contracting industries, but the retiree premium does not differ between administrative/managerial and other personnel. This pattern of retiree premiums in federal government and

[1] See, for example, Smith and Welch (1977).

defense contractor employment presumably explains why, in the comparison of means, we observe a large fraction of retirees employed in these sectors.

Unionization: Wage rates are significantly higher in unionized than in other industries. The differential increases with experience level, which probably reflects union seniority rules. Contrary to the expectation that retirees might be disadvantaged in attempting to join unions, because of their late entry into the civilian labor force, there is no significant difference in either the mean level of unionization or returns to unionization for retirees.[1]

Constant: The retiree constant interaction term is significantly positive. The size of this differential is sensitive to the regression specification; it is less than unity if the dependent variable is log of weekly earnings (annual earnings divided by weeks worked), which effectively constrains the coefficient of weeks to unity.

DECOMPOSING THE RETIREE DIFFERENTIAL

The estimated regression coefficients are used here to decompose the retiree earnings differential into the part attributable to differences in job-related characteristics and the part attributable to differences in the return to those characteristics. In other words, the veteran/retiree differential can be written as the sum of two parts: the difference between what veterans actually earned and what they would have earned, with retiree returns, plus the difference between what retirees would have earned with veteran characteristics and what they actually earned.[2] The decomposition may be stated in terms of the notation of Eq. (1):

$$\ln AE_V = X_V\beta + \varepsilon$$
$$\ln AE_R = X_R(\beta + \gamma) + \varepsilon ,$$

[1]This is a crude test, because retiree membership of unions cannot be directly observed. It may be low relative to the average in the industries in which they are employed, which is the measure of unionization used here.

[2]The vector of coefficients, which measures the effect of characteristics on earnings ($\beta + \gamma$), is referred to as "retiree returns."

where subscript V denotes noncareer veterans and subscript R denotes retirees.

$$\begin{aligned} \ln AE_V - \ln AE_R &= X_V\beta - X_R(\beta + \gamma) \\ &= [X_V\beta - X_V(\beta + \gamma)] + [X_V(\beta + \gamma) - X_R(\beta + \gamma)] \qquad (3) \\ &= -X_V\gamma + (X_V - X_R)(\beta + \gamma) \\ &= \ln AE_V - \ln \hat{A}E_V + \ln \hat{A}E_R - \ln AE_R \ . \qquad (3') \end{aligned}$$

The first term on the right hand side of Eq. (3') is the adjustment in veteran earnings that would result if they had retiree returns. This is pure second career earnings loss. The second term is the part of the differential due to differences in job-related characteristics $(X_V - X_R)$--the difference between what retirees would have earned, given veteran characteristics, and what they actually earned.

The estimates of this decomposition are reported in Table 5 for whites in experience classes 21-25 and 26-30. For each experience class the first column reports the differential in the mean of $(\log_e)$ annual earnings due to job-related characteristics $[(X_V - X_R)(\beta + \gamma)]$ and the second column reports the differential due to retiree returns $(X_V\gamma)$. The third column is the difference between the first and the second column.

Because entries in Table 5 are linear components of the difference in mean $(\log_e)$ earnings, they can be converted to percentages by exponentiation. For experience class 21-25, the difference between mean $(\log_e)$ veteran earnings and mean $(\log_e)$ retiree earnings is .192, or roughly 21 percent. Retiree characteristics and differential retiree returns contribute roughly equal amounts to this overall differential (10 percent and 11 percent). Similarly, for experience class 26-30 the overall differential is 15.7 percent; roughly 7 percent of this is due to characteristics, 8 percent to returns.[1] Thus approximately

[1] Differentials in Table 5 differ slightly from those reported in Tables 2 and 3 because the difference in the mean of $\log_e$ earnings is the ratio of the geometric means of actual earnings, whereas Tables 2 and 3 report arithmetic means.

Table 5

DECOMPOSITION OF WHITE VETERAN/RETIREE WAGE DIFFERENTIAL

	Experience 21-25			Experience 26-30		
	Veteran Characteristics[a]	Retiree Interaction[b]	Total[c]	Veteran Characteristics[a]	Retiree Interaction[b]	Total[c]
HOURS AND WEEKS						
Hours	.003		.003	.003		.003
Weeks	.017	-1.270	1.287	.019	-1.426	1.445
SCHOOL AND EXPERIENCE						
School	.001	-.412	.413	.000	-.376	.376
High School Grad	-.015		-.015	-.004		-.004
College	.062	.015	.047	.029	.023	.006
College Grad	.005		.005	.001		.001
In School	.001		.001	.002		.002
Experience	-.001	-.357	.356	-.001	-.134	.135
LOCATION						
North Central	-.004		-.004	-.003		-.003
South	.022		.022	.024		.024
West	.009		.009	.009		.009
SMSA	-.003	-.018	.015	-.000	-.069	.069
INDUSTRY AND OCCUPATION						
Feds	-.001	.005	-.006	-.005	.009	-.014
State & Local Govt	.000	.011	-.011	-.001	.002	-.003
Govt Purchases	.000		.000	-.000		-.000
DoD Purchases	-.001	.009	-.010	-.001	.005	-.006
White Collar	.005	-.018	.023	.001	-.031	.032
Prof/Admin/Managerial	.005		.005	-.001		-.001
DoD Purch × Admin/Mgr	.000		.000	-.001		-.001
Percent Union	.004		.004	.005		.005
Military Base	-.010	-.007	-.003	-.012	-.007	-.005
RESIDUAL						
		1.940			1.923	
TOTAL						
	.099	-.102	.192	.064	-.081	.146

[a] $(X_V - X_R)(\beta + \gamma)$.

[b] $(X_V\gamma)$.

[c] $(X_V - X_R)(\beta + \gamma) - X_V\gamma$.

half the overall differential is attributed to job-related characteristics. These characteristics are the result of voluntary choice on the part of retirees and are only attributable to military service to the extent military service affects the opportunity set and induces choices that result in lower earnings, but not necessarily lower real income or welfare.

Most important of the job-related characteristics affecting earnings are level of schooling and location. For experience class 21-25, retiree earnings would be 5.4 percent higher if retirees had the schooling distribution of noncareer veterans. Lower mean schooling, in particular fewer years of graduate education, accounts for 5.4 percent or roughly one-quarter of the total retiree differential. Location in the south and west account for a further 3 percent, and shorter hours and weeks an additional 2 percent. For the older experience class the pattern is similar, but with the difference due to schooling reduced to 2.6 percent. The effect of difference in industry and occupation are small: less than 2 percent overall, for both experience classes.

Although the net effect of differential retiree returns is small (8 to 11 percent), individual effects are large but tend to be offsetting. Most striking is the large negative return to weeks worked. As noted above, there is no simple interpretation of the coefficient of weeks in these earnings regressions because weeks are endogenous, so estimated coefficients compound several structural coefficients of both the demand and supply of labor. The large negative return to weeks is more than offset by the positive retiree residual. If the coefficient on weeks is constrained to unity and the regression is run with log of weekly earnings as the dependent variable, the retiree residual (the constant term in the regression) is small but still positive. Of the other variables, lower retiree returns to high school and to experience contribute most to the differential. As discussed above, the lower apparent retiree returns to schooling are probably a selection effect.

VI. CONCLUSION

This report has presented evidence on the civilian earnings of military retirees, relative to noncareer veterans, using data from the 1970 Census. The Census does not explicitly identify military retirees, so retiree and noncareer veteran status are imputed to veterans on the basis of their age and the conflicts in which they served. Internal and external checks provide reassurance that the samples are accurately identified and hence that the earnings comparisons are valid. Because of limited ability to identify retirees, the sample is confined to men who retired between 1964 and 1969 and who were less than 60 in 1969. It is thus not a random sample of all retirees but is restricted to younger cohorts who recently entered the civilian sector. The sample is further restricted to persons employed at least 27 weeks in 1969, and conclusions cannot be extrapolated to retirees choosing not to work full time or to be self-employed.

On average, weekly wages of retirees are typically 10 to 20 percent lower than weekly wages of noncareer veterans. The difference varies by race and level of schooling. Among whites, the difference is smaller for high school dropouts than high school or college graduates; for blacks the difference is generally smaller than for whites and is often positive, but statistical significance levels are low for blacks, because of small samples.

These estimates cannot be immediately interpreted as evidence of the extent of second career earnings loss--i.e., the extent to which the civilian earning potential of retirees is reduced as a result of their service in the military. Two major factors contribute to observed earnings differentials, in addition to true second career earnings loss. First, actual retiree earnings may be less than potential earnings because of certain choices that tend to reduce nominal earnings but not necessarily real income or welfare, such as hours of work and location. Roughly half of the total retiree differential in annual earnings is attributable to differences in job-related characteristics.

Second, and more serious, the residual difference is a biased estimate of true second career earnings loss because it is contaminated to an unknown extent by differences in unobservable characteristics between retirees and the control group of noncareer veterans. To the extent that individuals select a military or civilian career on the basis of expected earnings, actual earnings of men who opted for a civilian career will tend to overstate the counterfactual civilian earnings of men who opted for a military career. Thus earnings comparisons such as those made here tend to overestimate true second career earnings loss. However, to the extent that the military has faced an excess supply of applicants and has been able to select the more able from the available pool, there is an offsetting selection effect, and earnings comparisons may underestimate or overestimate true second career earnings loss.

If true second career earnings loss were the same for all individuals, observed earnings differences are expected to be smallest for those groups within which the military has selected the more able individuals. The observed smaller differentials for high school dropouts and blacks of all levels of schooling are consistent with the hypothesis, based on casual evidence, that the military has succeeded in selecting the more able individuals within these groups.[1] Although this conclusion is tentative, the fact that the observed pattern of differentials is consistent with a selection model does underscore the potential importance of selection bias in the estimates of second career earnings loss. It suggests that the residual earnings differential of less than 10 percent after job-related characteristics are controlled for is an upper bound on true second career loss in the first years after entry to the civilian labor force. This in turn is likely to be an upper bound on life cycle second career earnings loss, if civilian skills are accumulated with experience in the civilian sector.

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[1]Evidence on active duty wage loss presented in Appendix B is consistent with this.

Appendix A

A NOTE ON VETERANS OF WORLD WAR II AND KOREA

The simple theory of second career wage loss predicts that the reduction in civilian earning power because of time spent in the military service should be positively related to the length of absence from the civilian labor market. Therefore, within the "other veteran" group we would expect to observe lower wages for those who served in both Korea and World War II (spent more than one term in the military) than for the remaining subgroup, assuming that the latter typically served only one term. After race, age, and education are controlled for, there is no difference in the wages of these two subgroups, so they have been combined into a single "other veteran" category, for purposes of comparison with the retirees.

This finding is interpreted not as a refutation of the theory of second career wage loss, but as evidence of the potential confounding effect of selection bias. Those who served in both World War II and Korea were selected on a different basis than veterans of other periods. In particular, compared with the situation during other periods, a large fraction of the eligible male population served in the military, and of those who served, a large fraction were enlisted by draft pressure rather than wage inducements. The first factor, increased size of the veteran relative to the nonveteran pool, will tend to raise the mean of both the veteran and nonveteran potential wage. The veteran/nonveteran differential may rise or fall, depending on the shape of the potential civilian wage distribution (see Fig. 1). The second factor, increased fraction of veterans drafted, will tend to raise the mean veteran potential wage relative to the nonveteran potential wage as the military draws men from the pool who would not enlist voluntarily because their civilian opportunities exceed their military opportunities.

Thus, if veterans who served in both World War II and Korea had higher potential civilian earnings than veterans of only one war, this positive selection bias will tend to offset and prevent measurement of the additional second career wage loss attributable to having served in two wars rather than one.

Appendix B
ACTIVE DUTY WAGE LOSS

Table B.1 shows wage levels of active duty personnel relative to other veterans, by race and level of education. The comparison is presented in order to give some idea of the extent of "active duty wage loss" and to corroborate conclusions drawn elsewhere in this report about the ability of the services to be more selective among some groups than others. In particular, if post-service (second career) wage loss did not differ by race or level of education, the military would be able to be more selective in those groups for which active duty wages are high relative to civilian earnings.

The income reported by active duty personnel in the Census corresponds in principle to base pay, because respondents were asked to exclude military bonuses and pay in kind. It therefore excludes fringe benefits, tax advantage, special pays, etc.[1] Because the data are for earnings in 1969, they reflect the 1967-69 career force pay increase but predate the first term pay increase that accompanied the introduction of the All Volunteer Force. Thus they do not precisely reflect relative active duty/civilian pay differentials either at the time the retiree sample entered the service or under current pay scales. However, although the average level of military pay may have changed relative to civilian pay, if differentials among race and education levels have remained roughly constant, conclusions about excess supply and ability to select, for different groups, can validly be based on these data.

For both whites and blacks, Table B.1 shows that active duty wage loss tends to diminish with years of military service. Taking high school graduates as prototypical of the enlisted force and college graduates as prototypical of the officer corps, active duty wage loss for enlisted men declines from 30 percent or more in the first two terms of service to 25 percent or less after 20 years. For officers, the negative differential is less than 15 percent throughout the first

[1] It may include any moonlighting income.

Table B.1

ACTIVE DUTY WAGES, RELATIVE TO CIVILIAN WAGES OF VETERANS, BY RACE AND EDUCATION LEVEL

Age	Some High School	High School Graduate	Some College	College Graduate
		Whites		
19-21	.65	.62	--	--
22-26	.64	.61	.58	--
27-31	.73	.72	.82	.86
32-36	.73	.72	.81	.89
37-41	.78	.75	.82	.89
42-46	.82	.80	.89	.88
47-51	1.03	.94	1.07	1.00
52-60	.97	1.01	.97	1.00
		Blacks		
19-21	.75	.71	--	--
22-26	.68	.65	.59	--
27-31	.77	.76	.74	.90
32-36	.88	.84	.74	1.06
37-41	.95	.90	.79	1.16
42-46	1.00	.81	1.00	1.06
47-51	1.02	.88	.74	1.07
52-60	1.26	1.14	1.27	1.07

20 years and is eliminated entirely for careers longer than 25 years.[1] This overstates the true differential for officers under the All Volunteer Force because under the draft conditions prevailing in 1969, 35 percent of persons with a college degree on active duty were in the enlisted force and were presumably concentrated in the younger age groups.

[1]This assumes entry at age 19 for enlisted men, 22 for officers. As noted above, the first-term negative differential has been reduced by the All Volunteer Force pay increase.

Because active duty wage loss is less for college graduates than for high school graduates, the military should be able to be more selective among college graduates than among high school graduates, assuming that *true* second career wage loss is independent of *level of schooling*. If this is the case, then *observed* second career wage loss should be less for college graduate retirees than for high school graduate retirees, reflecting the fact that the college graduate retirees are more able, relative to their civilian counterparts. This is borne out by the retiree wage ratios in Table 2.

For white enlisted men, the active duty wage loss is always lower for those with less than a high school degree than for those with a high school degree. This is consistent with the presumption that the military is able to attract the more able from the high school dropout pool. Again this is confirmed by the post service earnings ratios in Table 4. Retirees with less than a high school degree earn more, relative to their civilian counterparts, than high school graduates.

Comparing the active duty wage loss for blacks and whites, for the enlisted force (high school dropouts and high school graduates), the differential is smaller for blacks than for whites, as predicted by considerations of selection stringency. For black officers (college graduates), at all ages beyond 27, there appears to be an active duty wage premium that increases dramatically for the few who stay on beyond 20 years of service.

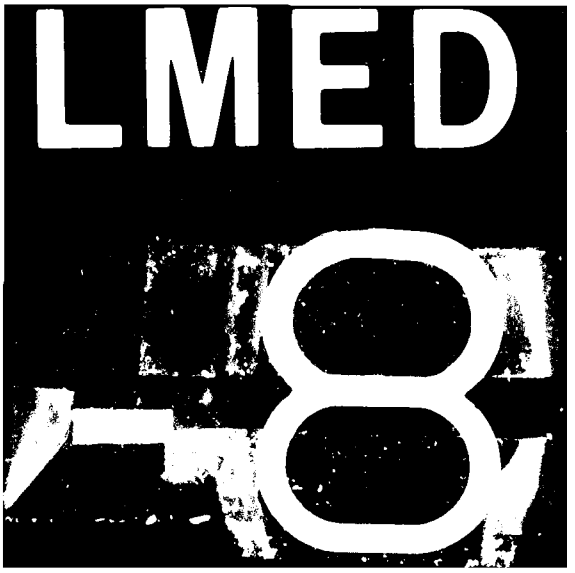
BIBLIOGRAPHY

Cooper, Richard V. L. (ed), *Defense Manpower Policy: Presentations from the 1976 Rand Conference on Defense Manpower*, The Rand Corporation, R-2396-ARPA, March 1979.

Mincer, Jacob, *Schooling, Experience, and Earnings*, National Bureau of Economic Research, New York, 1974.

Smith, James P., and Finis Welch, "black-White Wages, 1960-1970," *American Economic Review*, 1977.

Willis, R. J., and Sherwin Rosen, "Education and Self Selection," *J.P.E.* (forthcoming).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